WHAT IS CLAIMED IS:

1. A power generation system for mitigating corona discharge, comprising:

a housing defining a cavity and having an inlet for receiving a fluid that is used to cool and pressurize the cavity and an outlet for removing the fluid from the cavity;

a rotor having a first end positioned within the cavity of the housing and a second end;

a plurality of bearings positioned to provide radial support to the rotor;

a turbine connected to the second end of the rotor;

a heat sink positioned within the cavity and between the housing and the rotor;

an electronic component attached to the heat sink; and

a reaction chamber for receiving the fluid from the outlet and for producing a substance that is directed to the turbine causing it to rotate.

2. The system as defined in claim 1, wherein the fluid is selected from a group consisting of a hydrogen gas, a nitrogen gas, a helium gas, an oxygen gas, an alcohol, a liquid rocket propellant, a liquid hydrogen, a liquid nitrogen, a liquid oxygen and combinations thereof.

3. The system as defined in claim 1, wherein the fluid is introduced into the cavity at a substantially constant rate.

4. The system as defined in claim 1, further comprising a supply conduit for receiving a second fluid and directing the second fluid to the reaction chamber.

5. The system as defined in claim 4, wherein the second fluid is selected from a group consisting of a hydrogen gas, a nitrogen gas, a helium gas, an oxygen gas,

an alcohol, a liquid rocket propellant, a liquid hydrogen, a liquid nitrogen, a liquid oxygen and combinations thereof.

6. The system as defined in claim 1, wherein the electrical device is selected from a group consisting of an electromagnetic interference filter, a resistor, an inverter, a gate driver, a sensor, a power supply, a controller and combinations thereof.

7. The system as defined in claim 1, further comprising a thrust disc connected to the first end of the rotor and a plurality of thrust bearings, positioned to contact the thrust disc, for providing axial support to the rotor.

8. The system as defined in claim 7, wherein the plurality of bearings and the plurality of thrust bearings are foil bearings.

9. The system as defined in claim 1, further comprising a stator attached to the heat sink and positioned adjacent to the rotor.

10. An electrical power generation system for mitigating corona discharge, comprising:

an outer housing defining a chamber and having an input conduit for receiving a fluid that is used to cool and pressurize the chamber and an output conduit for removing the fluid from the chamber;

a turbine positioned adjacent to the outer housing;

a rotor positioned within the chamber and connected to the turbine for rotating about a central axis;

an inner housing positioned within the chamber and between the outer housing and the rotor;

a plurality of electronic components attached to the inner housing and cooled by the fluid;

a stator attached to the inner housing and positioned adjacent to the rotor;

a plurality of bearings, positioned adjacent to the stator, for providing radial support to the rotor and cooled by the fluid; and

a reaction chamber for receiving the fluid from the output conduit and producing a material that is directed to the turbine causing it to rotate.

11. The system as defined in claim 10, further comprising a supply conduit for receiving a second fluid and directing the second fluid to the reaction chamber.

12. The system as defined in claim 10, wherein the plurality of electrical components are selected from a group consisting of an electromagnetic interference filter, a bleed resistor, an inverter, a gate driver, a sensor, a power supply, a controller and combinations thereof.

13. The system as defined in claim 10, further comprising a thrust disc connected to the rotor and a plurality of thrust bearings, positioned adjacent to the thrust disc, for providing axial support to the rotor.

14. The system as defined in claim 13, wherein the plurality of bearings and the plurality of thrust bearings are self-acting, hydrodynamic foil bearings.

15. A method for mitigating corona discharge, comprising:

introducing a fluid into a cavity defined by an outer housing, the fluid being used to pressurize the cavity and to cool a rotor, a stator, a plurality of bearings and a plurality of electrical components;

removing the fluid from the cavity; and

directing the fluid into a reaction chamber that produces a material used to cause a turbine that is attached to the rotor to rotate.

16. The method as defined in claim 15, wherein the fluid is selected from a group consisting of a hydrogen gas, a nitrogen gas, a helium gas, an oxygen gas, an alcohol, a liquid rocket propellant, a liquid hydrogen, a liquid nitrogen, a liquid oxygen and combinations thereof.

17. The method as defined in claim 15, further comprising introducing a second fluid into the reaction chamber to be combined with the fluid.

18. The method as defined in claim 17, wherein the second fluid is selected from a group consisting of a hydrogen gas, a nitrogen gas, a helium gas, an oxygen gas, an alcohol, a liquid rocket propellant, a liquid hydrogen, a liquid nitrogen, a liquid oxygen and combinations thereof.

19. The method as defined in claim 15, further comprising directing the fluid to a heat sink to cool the heat sink, wherein the stator and the plurality of electrical components are attached to the heat sink.

20. The method as defined in claim 15, wherein the plurality of electronic components are selected from a group consisting of an electromagnetic interference filter, a bleed resistor, an inverter, a gate driver, a sensor, a power supply, a controller and combinations thereof.